March 31, 1988

HAZARDOUS RANKING SYSTEM PACKAGE
NAVAL STATION, TREASURE ISLAND
HUNTERS POINT ANNEX
SAN FRANCISCO, CALIFORNIA

DEPARTMENT OF THE NAVY
WESTERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
SAN BRUNO, CALIFORNIA 94066

12ND WESTDIV 5000/1 (7-72)

TABLE OF CONTENTS

1.0 INTRODUCTION

This Hazard Ranking System (HRS) package has been prepared by Harding Lawson Associates (HLA) for the Naval Facilities Engineering Command, Western Division (WESTDIV) and applies to the Naval Station, Treasure Island, Hunters Point Annex (HPA), San Francisco, California (Plate 1). The HPA was scored as a single site; each smaller site at HPA was considered during the evaluation and worst case scenarios were used throughout the scoring.

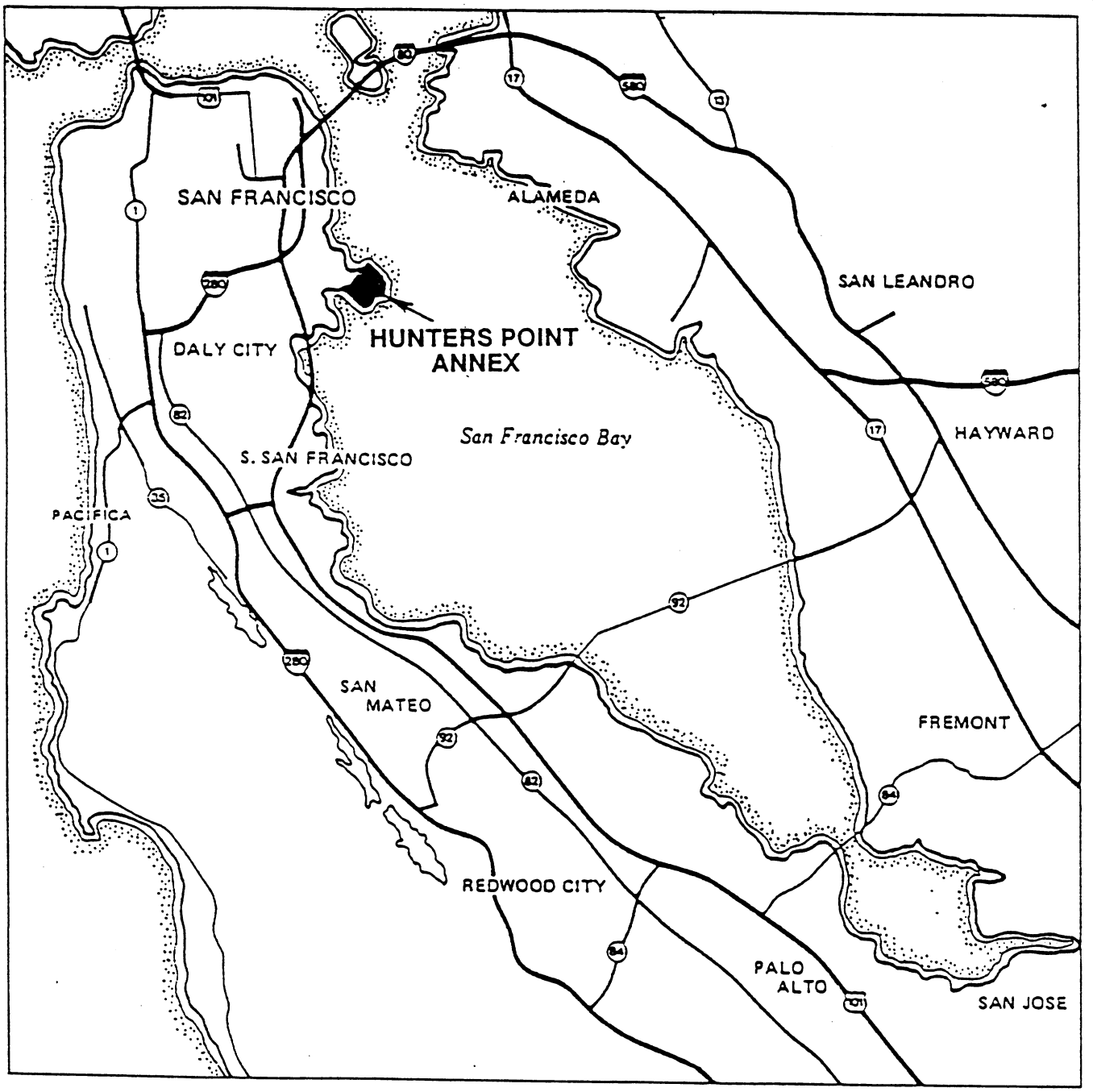
The HRS package includes a description of the HPA site, HRS worksheets, HRS documentation records, and a bibliography that supports the HRS package. Copies of each reference in the bibliography are available upon request.

1.1 Site Location and Description

HPA is located in southeastern San Francisco at the tip of a peninsula extending eastward into San Francisco (Plate 1). The Navy property encompasses a total of 965 acres; of these, 522 acres comprise the on-land facilities, with the remaining area a portion of San Francisco Bay. The facility is bounded on three sides by San Francisco Bay and on the fourth by the Hunters Point district, which consists of both public and private residential housing and commercial/industrial buildings.

The northern and eastern shores of HPA are developed for ship repair and are equipped with drydock and berthing facilities. No shipping facilities are present along the southern shore, which consists primarily of emplaced fill.

Approximately 70 to 80 percent of the lands within HPA are relatively level lowlands that were constructed by placing fill along the bay margin. The remaining area is a moderately sloping ridge in the northwestern portion of the site. Elevations across



Harding Lawson Associates
Engineers and Geoscientists

Location Map
HRS Documentation
Hunters Point Annex
San Francisco, California

PLATE
1

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
ML	2176,145.02		3/88		

the site (in feet above Mean Sea Level, MSL) range from 6 to 10 feet in the lowlands to 176 feet along the site's northwestern border.

1.2 Site History

Hunters Point was operated as a commercial dry dock facility from 1869 until December 29, 1939, when the property was purchased by the U.S. Navy. Following the purchase, the facility was leased to the Bethlehem Steel Company until December 18, 1941. On that date, the Navy took possession of the property and began operating the shipyard facility.

In May 1976, most of the shipyard was leased to Triple A Machine Shop, Inc. (Triple A), which operated it as a commercial ship repair facility until June 1986. Triple A subleased portions of the facility to industrial and commercial firms. These tenants used the facilities for warehouse and distribution centers. Activities by both the Navy and Triple A were related to ship repair, maintenance, and construction. Consequently, similar materials were used by the Navy and Triple A, including paints, solvents, fuels, acids and bases, metals, polychlorinated biphenyls (PCBs), and asbestos. Information on waste generation and disposal by the Navy is presented in the Initial Assessment Study (5) which investigated Navy disposal activities at HPA during the period from 1941 through 1974. Information on the activities of Triple A from 1976 to 1987 has been developed by the Navy and the San Francisco District Attorney's Office (2). No data are currently available regarding activities prior to 1941 (when the Navy took possession of HPA) or activities by Triple A's sublease holders.

The Triple A lease was not renewed in 1987, and the Navy regained possession of HPA at that time.

1.3 Previous Investigation Summary

Site investigation activities at HPA were initiated by the Navy in 1984 as part of the Navy Assessment and Control of Installation Pollutants (NACIP) program. The NACIP program was developed to identify and control environmental contamination from past hazardous materials use and disposal activities at Navy and Marine Corps installations and is similar to the Environmental Protection Agency's (EPA) Superfund program. This program has since been renamed the Installation Restoration (IR) program.

The Initial Assessment Study (5) identified 12 areas at HPA where hazardous wastes were disposed or spilled. The study was based upon a review of available records pertaining to chemical handling and disposal practices, interviews with site personnel, and an on-site survey of activities at HPA. Further investigation was performed in the Verification Step of the IR program (1) which included the collection of soil and ground-water samples at 11 sites to verify the presence of contaminants. Volatile organic compounds (VOCs), semi-volatile organic compounds (SOCs), polychlorinated biphenyls (PCBs), and asbestos were detected at varying concentrations in samples collected at HPA sites during that investigation.

In addition to the NACIP-related studies, an area survey to investigate potential soil contamination by asbestos and other hazardous materials was conducted at HPA (1). Chemicals detected in this study are similar to those detected in the Verification Step of the IR.

Soil contamination by PCBs was discovered in 1986 in the vicinity of former Building 503 during routine construction activities (3). A preliminary characterization study was conducted to determine the distribution of PCBs in the soils and, based on

that data, an interim cleanup plan was developed and initiated by the Navy in consultation with the Department of Health Services (DHS), the Regional Water Quality Control Board (RWQCB), and the EPA. Soils containing PCBs at concentrations greater than 25 milligrams per kilogram (mg/kg) were removed and transported to an off-site disposal facility. To date, a total of 1,255 cubic yards of PCB-contaminated soil has been removed. As part of the verification of the interim cleanup, soil samples have been collected at the limits of the excavation to verify that soils containing greater than 25 mg/kg have been removed. This verification sampling is currently being conducted.

A detailed summary of investigations performed at the HPA is provided in the "Scoping Document" (12).

1.4 Summary of Proposed Remedial Investigations

The Navy is conducting Remedial Investigations/Feasibility Studies (RI/FSs) at HPA as part of the Navy's IR program. Under the IR program for HPA, 11 sites have been identified to date as requiring further field investigation. The sites consist of the 10 sites investigated in the Verification Step and the former Building 503 PCB spill site. These sites have been numbered as IR sites and are listed on Table 1.

Field methods that will be used during the proposed field investigations include:

- Geophysical surveys
- Radioactivity surveys
- Exploratory drilling and associated soil sampling
- Monitoring well installation
- Excavation of test pits and trenches
- Surface soil sampling
- Surface-water and ground-water sampling

- Physical characterization of aquifers
- Tidal influence studies
- Air monitoring

Table 1 summarizes proposed field activities at each site.

Seven Triple A sites that are not currently included in the RI/FS will be investigated initially as Preliminary Assessment/Site Inspections (PA/SI). Additional characterization at the PA/SI sites is not addressed in this summary because insufficient data currently exist to fully evaluate the presence of hazardous materials. However, based on the available data, the PA/SI sites are not expected to contain waste materials, if any, that differ from those found in the IR sites. If the preliminary investigations indicate other hazardous materials are present at these sites, each PA/SI site will then be addressed as appropriate. The remainder of the HPA will also be addressed. The initial step will be to evaluate existing information on chemical usage, handling, and disposal by the Navy as well as other occupants. The information may consist of, but not be limited to, data developed during the Initial Assessment Study (5), additional Navy records, and interviews with Navy personnel.

Table 1. Summary of Proposed Field Work
Naval Station, Treasure Island
Hunters Point Annex
San Francisco, California

Site	Soil Sampling	Ground-Water Sampling	Air Survey	Radioactivity Survey
IR-1, Industrial Landfill	X	X	X	X
IR-2, Bay Fill Area	X	X	X	X
IR-3, Oil Reclamation Ponds	X	X	X	
IR-4, Scrap Yard	X	X	X	
IR-5, Old Transformer Yard	X	X	X	
IR-6, Tank Farm	X	X		
IR-7, Sub-Base Area	X	X		X
IR-8, Building 503 PCB Spill Area	X	X	X	
IR-9, Pickling and Plate Yard	X	X		
IR-10, Battery and Electroplating shop	X	X		
IR-11, Building 521 Power Plant	X	X		

2.0 PRELIMINARY ASSESSMENT FORMS

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION

01 STATE	02 SITE NUMBER

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER				
Naval Station, Treasure Island, Hunters Point Annex					
03 CITY	**04 STATE**	**05 ZIP CODE**	**06 COUNTY**	**07 COUNTY CODE**	**08 CONG. DIST**
San Francisco	CA	94130	San Francisco		
09 COORDINATES LATITUDE: 37 37 30.0	LONGITUDE: 122 22 30.0				

10 DIRECTIONS TO SITE (Starting from nearest public road)

From Highway 101 south - Exit at 3rd Street and proceed east on Evans Street to the Maingate via Innes St. & Evans St.

III. RESPONSIBLE PARTIES

01 OWNER (If known)	02 STREET (Business, mailing, residential)		
United States Navy	Naval Station Treasure Island		
03 CITY	**04 STATE**	**05 ZIP CODE**	**06 TELEPHONE NUMBER**
San Francisco	CA	94130	(415) 765-5613
07 OPERATOR (If known and different from owner)	**08 STREET** (Business, mailing, residential)		
United States Navy	Innes & Evans Street		
09 CITY	**10 STATE**	**11 ZIP CODE**	**12 TELEPHONE NUMBER**
San Francisco	CA	94130	(415) 822-1243

13 TYPE OF OWNERSHIP (Check one)

☐ A. PRIVATE ☒ B. FEDERAL Navy - Dept. of Defense (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL

☐ F. OTHER: _____ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)

☐ A. RCRA 3001 DATE RECEIVED: ___/___/___ (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: ___/___/___ (MONTH DAY YEAR) ☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION (several) inspec- tion -to- 4/6/88

☒ YES ☐ NO DATE 12/28/87 (MONTH DAY YEAR)

BY (Check all that apply): ☐ A. EPA ☐ B. EPA CONTRACTOR ☐ C. STATE ☐ D. OTHER CONTRACTOR ☐ E. LOCAL HEALTH OFFICIAL ☒ F. OTHER: Navy-contractor (Specify)

CONTRACTOR NAME(S): Harding Lawson Associates

02 SITE STATUS (Check one)

☒ A. ACTIVE ☐ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION

1869 (BEGINNING YEAR) | still operating (ENDING YEAR) ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED

Fuel oils, waste oils, paint waste, solvents, acids and bases, metals, PCB's, asbestos, semi and volatile organic compounds

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION

Potential contamination of shallow soils - fill and shallow aquifer to 35 - 40 feet
Potential for impact on S.F. Bay waters

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)

☐ A. HIGH (Inspection required promptly) ☒ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)			03 TELEPHONE NUMBER
Captain C.T. Vaught, Commanding Officer	COMNAVBASE/U.S. Navy			(415) 765-5613
04 PERSON RESPONSIBLE FOR ASSESSMENT	**05 AGENCY**	**06 ORGANIZATION**	**07 TELEPHONE NUMBER**	**08 DATE**
Glenn S. Goodman		Harding Lawson Associates	(415) 892-0821	4/4/88 (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

F3676-R

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- [X] A. SOLID
- [ ] B. POWDER, FINES
- [X] C. SLUDGE
- [ ] D. OTHER (Specify) unknown solids
- [ ] E. SLURRY
- [X] F. LIQUID
- [ ] G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

- TONS: 260,000
- CUBIC YARDS: 5.2×10^6
- NO. OF DRUMS: 3.6×10^6

03 WASTE CHARACTERISTICS (Check all that apply)

- [X] A. TOXIC
- [X] B. CORROSIVE
- [X] C. RADIOACTIVE
- [X] D. PERSISTENT
- [X] E. SOLUBLE
- [ ] F. INFECTIOUS
- [X] G. FLAMMABLE
- [X] H. IGNITABLE
- [X] I. HIGHLY VOLATILE
- [ ] J. EXPLOSIVE
- [X] K. REACTIVE
- [ ] L. INCOMPATIBLE
- [ ] M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE	unknown	-	sludge in tanks & land spreading
OLW	OILY WASTE	1.8×10^8	gallons	various oils landspread/pond
SOL	SOLVENTS	unknown	-	quantities mixed w/waste oil
PSD	PESTICIDES	-	-	
OCC	OTHER ORGANIC CHEMICALS	>250	gallons	
IOC	INORGANIC CHEMICALS			
ACD	ACIDS	unknown	-	discharge to storm sewer
BAS	BASES			
MES	HEAVY METALS	$>5 \times 10^6$	yd^3	sand blast waste used-fill material

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
OCC	PCB's	1336-36-3	oil reclamation/spills	1-200	PPM
IOC	Asbestos	1332-21-4	landfill/pipe insulate	1-35	%
IOC	Radium Dials	-	landfill suspect	unknown	
MES	Sandblast waste (metals)	-	base-wide fill	1-20,000	mg/kg
OLW	Diesel Fuel	-	land spreading/oil-ponds	210,000	mg/kg
ACD	Sulfuric Acid	7664-93-9	sanitary/storm sewers	-	
ACD	Phosphoric Acid	7664-38-2	sanitary/storm sewers	-	
OCC	Xylene	1330-20-7	landfill	36-42,000	mg/kg
OCC	Trichlorobenzene	12002-48-1	landfill	250	mg/kg
OCC/SOL	Trichloroethane	25323-89-1	landfill	1-560	mg/kg
OCC	Dichlorobenzene	25321-22-6	oil rec. ponds	92,00	mg/kg
OCC	Dichloroethane	75-34-3	landfill	45-1300	mg/kg
OCC	Chlorobenzene	108-90-7	landfill	28	mg/kg
OCC	Ethyl Benzene	100-41-4	oil ponds/landfill	3-12000	mg/kg
OCC	Vinyl Chloride	75-01-4	landfill/ oil ponds	29-57	mg/kg
OCC	Napthalene	91-20-3	oil ponds/landfill	960-48000	mg/kg

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS	N/A		FDS		
FDS	N/A		FDS		
FDS	N/A		FDS		
FDS	N/A		FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See all sources listed in HRS Biblography.

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE | 02 SITE NUMBER

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 [X] A. GROUNDWATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: _____
02 [X] OBSERVED (DATE 10/87) [ ] POTENTIAL [ ] ALLEGED
04 NARRATIVE DESCRIPTION
Confirmation verification study detected PCB's, lead, zinc, chromimum, nickel, waste oil, in ground water

01 [X] B. SURFACE WATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: >10,000
02 [ ] OBSERVED (DATE: _____) [ ] POTENTIAL [X] ALLEGED
04 NARRATIVE DESCRIPTION
Discharges to storm/sanitary sewer were to alleged to contain spent acids and electrolyte solutions.

01 [X] C. CONTAMINATION OF AIR
03 POPULATION POTENTIALLY AFFECTED: >10,000
02 [ ] OBSERVED (DATE: _____) [ ] POTENTIAL [X] ALLEGED
04 NARRATIVE DESCRIPTION
Past burning of hazardous substances and waste oils (possibly containing PCB's)

01 [X] D. FIRE/EXPLOSIVE CONDITIONS
03 POPULATION POTENTIALLY AFFECTED: _____
02 [ ] OBSERVED (DATE _____) [X] POTENTIAL [ ] ALLEGED
04 NARRATIVE DESCRIPTION
Oils, fuels, spent solvents all exist at the site

01 [X] E. DIRECT CONTACT
03 POPULATION POTENTIALLY AFFECTED: _____
02 [X] OBSERVED (DATE 8/6/86) [ ] POTENTIAL [ ] ALLEGED
04 NARRATIVE DESCRIPTION
Lt. Leroy stated that he,"experienced a skin rash and other negative reactions" after sampling waste oils from a storage tank facility

01 [X] F. CONTAMINATION OF SOIL
03 AREA POTENTIALLY AFFECTED: >200 (Acres)
02 [X] OBSERVED (DATE 10/87) [ ] POTENTIAL [X] ALLEGED
04 NARRATIVE DESCRIPTION
Confirmation verification study indicated numerous metals and PCB's contaminated soils. Also allegation have been made that waste oils, solvents and metals were disposed of across the site.

01 [ ] G. DRINKING WATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: _____
02 [ ] OBSERVED (DATE: _____) [ ] POTENTIAL [ ] ALLEGED
04 NARRATIVE DESCRIPTION
N/A Ground water at the site not used for drinking water source

01 [X] H. WORKER EXPOSURE/INJURY
03 WORKERS POTENTIALLY AFFECTED: 1-4000
02 [ ] OBSERVED (DATE: _____) [X] POTENTIAL [ ] ALLEGED
04 NARRATIVE DESCRIPTION
Potential for dermal contact, inhalation or ingestion during daily activities. HPA population normally approximate 1000 and may increase to 4000 when naval vessels are in port.

01 [X] I. POPULATION EXPOSURE/INJURY
03 POPULATION POTENTIALLY AFFECTED: 1-4000
02 [ ] OBSERVED (DATE: _____) [X] POTENTIAL [ ] ALLEGED
04 NARRATIVE DESCRIPTION
same as above

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE	02 SITE NUMBER

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☒ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Oily wastes and metals may affect herbaceus and woody plant growth

01 ☒ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION (include name(s) of species)

Discharges to the bay may affect marine fauna and migrating water fowl

01 ☒ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Damage to food chain is possible

01 ☒ M. UNSTABLE CONTAINMENT OF WASTES (Spills, runoff, standing liquids, leaking drums) — 02 ☐ OBSERVED (DATE: 12/87) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

Runoff from waste areas is uncontrolled and no infiltration controls exist

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

N/A

01 ☒ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — XX ALLEGED
04 NARRATIVE DESCRIPTION

Spent acids and waste oils that were allegedly discharged to sewer systems may have contaminated or physically damaged these

01 ☒ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — XX ALLEGED
04 NARRATIVE DESCRIPTION

Triple A Machine Shop, Inc., currently under investigation for alleged illegal disposal of hazardous substances by the San Francisco District Attorneys Office.

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

Possible radiation contamination is sandlast waste material and or radium dials buried in the Industrial landfill.

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

Due to the uncertainty of waste, sludge and solid materials disposed of at the site, the quantities presented here are only estimates.

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis reports)

See references from HRS Documentation

3.0 HAZARD RANKING SCORE SHEETS

3.1 **Facility Name:** Naval Station, Treasure Island, Hunters Point Annex (HPA)

Location: San Francisco, California

EPA Region: 9

Person(s) in charge of the facility: Cpt. C.T. Vaught, Commd. Officer
Naval Station,
Treasure Island, San Francisco

Name of Reviewer: _____ **Date:** _____

General description of the facility:

(For example: landfill, surface impoundment pile, container; types of hazardous substances; location of the facility; contamination route of major concern; types of information needed for rating; agency action, etc.)

HPA is located in the San Francisco Bay area along the east portion of the San Francisco Peninsula. The site encompasses 965 acres which is bounded on 3 sides by SF Bay and on the fourth by the HP district consisting of public and private residential housing and commercial industrial buildings. The site is a disestablished naval shipyard that was leased to commercial tenants. The site is now operated by Naval Station, Treasure Island.

Initial Assessment Study indicates that hazardous substances are present at the site within and not limited to: an industrial landfill, electroplating and battery facilities, various fill areas, transformer storage areas, pickling and plating yard, oil reclamation ponds, and a PCB spill area.

The Navy is currently conducting a Remedial Investigation/Feasibility Study to characterize the soil and ground water at HPA.

Scores: $S_M = 10.69$ ($S_{gw} = 6.12$ $S_{sw} = 17.45$ $S_a = 0$)
$S_{FE} = 75$
$S_{DC} = 100$

HRS COVER SHEET

Harding Lawson Associates

	S	S^2
Groundwater Route Score (S_{gw})	6.12	37.45
Surface Water Route Score (S_{sw})	17.45	304.66
Air Route Score (S_a)	0	0
$S_{gw}^2 + S_{sw}^2 + S_a^2$		342.11
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		18.50
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} / 1.73 = S_M =$		10.69

WORKSHEET FOR COMPUTING S_M

Ground Water Route Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Observed Release	0 (45)	1	45	45	3.1
If observed release is given a score of 45, proceed to line 4. If observed release is given a score of 0, proceed to line 2.					
2 Route Characteristics					3.2
Depth to Aquifer of Concern	0 1 2 3	2		6	
Net Precipitation	0 1 2 3	1		3	
Permeability of the Unsaturated Zone	0 1 2 3	1		3	
Physical State	0 1 2 3	1		3	
Total Route Characteristics Score				15	
3 Containment	0 1 2 3	1		3	3.3
4 Waste Characteristics					3.4
Toxicity/Persistence	0 3 6 9 12 15 (18)	1	18	18	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 (8)	1	8	8	
Total Waste Characteristics Score			26	26	
5 Targets					3.5
Ground Water Use	0 (1) 2 3	3	3	9	
Distance to Nearest Well/Population Served	(0) 4 6 8 10 12 16 18 20 24 30 32 35 40	1	0	40	
Total Targets Score			3	49	
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5			3570	57,330	
7 Divide line 6 by 57,330 and multiply by 100			S_{gw} = 6.12		

GROUND WATER ROUTE WORK SHEET

Surface Water Route Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Observed Release	(0) 45	1	0	45	4.1
If observed release is given a value of 45, proceed to line 4. If observed release is given a value of 0, proceed to line 2.					
2 Route Characteristics					4.2
Facility Slope and Intervening Terrain	0 (1) 2 3	1	1	3	
1-yr. 24-hr. Rainfall	0 1 (2) 3	1	2	3	
Distance to Nearest Surface Water	0 1 2 (3)	2	6	6	
Physical State	0 1 2 (3)	1	3	3	
Total Route Characteristics Score			12	15	
3 Containment	0 1 2 (3)	1	3	3	4.3
4 Waste Characteristics					4.4
Toxicity/Persistence	0 3 6 9 12 15 (18)	1	18	18	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 (8)	1	8	8	
Total Waste Characteristics Score			26	28	
5 Targets					4.5
Surface Water Use	0 1 (2) 3	3	6	9	
Distance to a Sensitive Environment	0 1 2 (3)	2	6	6	
Population Served/Distance to Water Intake Downstream	(0) 4 6 8 10 / 12 16 18 20 / 24 30 32 35 40	1	0	40	
Total Targets Score			12	55	
6 If line 1 is 45, multiply 1 x 4 x 5. If line 1 is 0, multiply 2 x 3 x 4 x 5			11232	64,350	
7 Divide line 6 by 64,350 and multiply by 100	S_{sw} = 17.45				

SURFACE WATER ROUTE WORK SHEET

Air Route Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Observed Release	(0) 45	1	0	45	5.1
Date and Location:					
Sampling Protocol:					
If line 1 is 0, the S_a = 0. Enter on line 5. If line 1 is 45, then proceed to line 2.					
2 Waste Characteristics					5.2
Reactivity and Incompatibility	0 1 2 3	1		3	
Toxicity	0 1 2 3	3		9	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1		8	
	Total Waste Characteristics Score			20	
3 Targets					5.3
Population Within 4-Mile Radius	0 9 12 15 18 21 24 27 30	1		30	
Distance to Sensitive Environment	0 1 2 3	2		6	
Land Use	0 1 2 3	1		3	
	Total Targets Score			39	
4 Multiply 1 x 2 x 3			0	35,100	
5 Divide line 4 by 35,100 and multiply by 100	S_a = 0				

AIR ROUTE WORK SHEET

Fire and Explosion Work Sheet

Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Containment	1 (3)	1	3	3	7.1
2 Waste Characteristics					7.2
Direct Evidence	(0) 3	1	0	3	
Ignitability	0 1 2 (3)	1	3	3	
Reactivity	0 1 (2) 3	1	2	3	
Incompatibility	0 1 (2) 3	1	2	3	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 (8)	1	8	8	
Total Waste Characteristics Score			15	20	
3 Targets					7.3
Distance to Nearest Population	0 1 2 3 4 (5)	1	5	5	
Distance to Nearest Building	0 1 2 (3)	1	3	3	
Distance to Sensitive Environment	0 1 2 (3)	1	3	3	
Land Use	0 1 2 (3)	1	3	3	
Population Within 2-Mile Radius	0 1 2 3 4 (5)	1	5	5	
Buildings Within 2-Mile Radius	0 1 2 3 4 (5)	1	5	5	
Total Targets Score			24	24	
4 Multiply 1 x 2 x 3			1080	1,440	
5 Divide line 4 by 1,440 and multiply by 100			SFE = 75		

FIRE AND EXPLOSION WORK SHEET

Direct Contact Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Observed Incident	0 (45)	1	45	45	8.1
If line 1 is 45, proceed to line 4 If line 1 is 0, proceed to line 2					
2 Accessibility	0 1 2 3	1		3	8.2
3 Containment	0 15	1		15	8.3
4 Waste Characteristics Toxicity	0 1 2 (3)	5	15	15	8.4
5 Targets					8.5
Population Within a 1-Mile Radius	0 1 2 3 4 (5)	4	20	20	
Distance to a Critical Habitat	0 1 2 (3)	4	12	12	
Total Targets Score			32	32	
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5			21600	21.600	
7 Divide line 6 by 21,600 and multiply by 100		S_{DC} = 100			

DIRECT CONTACT WORK SHEET

4.0 DOCUMENTATION RECORDS FOR HAZARD RANKING SYSTEM

INSTRUCTIONS: The purpose of these records is to provide a convenient way to prepare an auditable record of the data and documentation used to apply the Hazard Ranking System to a given facility. As briefly as possible summarize the information you used to assign the score for each factor (e.g., "Waste quantity = 4.230 drums plus 800 cubic yards of sludges"). The source of information should be provided for each entry and should be a bibliographic-type reference that will make the document used for a given data point easier to find. Include the location of the document and consider appending a copy of the relevant page(s) for ease in review.

FACILITY NAME: Hunters Point Annex

LOCATION: San Francisco, California

DATE SCORED: 12/28/87

PERSON SCORING: Glenn S. Goodman (Harding Lawson Associates)

PRIMARY SOURCE(S) OF INFORMATION (e.g., EPA Region, state, FIT, etc.):

Site Investigation Reports: Initial Assessment Study, Confirmation Verification Step, San Francisco District Court District Attorney Complaint

FACTORS NOT SCORED DUE TO INSUFFICIENT INFORMATION:

Air Route - observed releases
Fire and explosion - direct evidence will be collected during RI/FS with direct reading instruments
Operational wells within 3 miles

COMMENTS OR QUALIFICATIONS:

Mountain Spring Water Company is located within 1 mile of the site. However, it was determined that the spring is not a ground-water well; it is actually defined as a surface water source according to a site visit. The spring is also both directionally, topographically, and hydraulically upgradient from the HPA site and therefore was not considered as a user of the aquifer of concern.

Sensitive environment was scored according to the potential exposure of endangered species and does not indicate that a Critical Habitat, as defined by the Fish and Wildlife Service, is within 1 mile of the HPA.

N/A = Not applicable
N/K = Not known at time of ranking

GROUND WATER ROUTE

1 OBSERVED RELEASE

Contaminant detected (5 maximum):

PCBs, lead, zinc, chromium, nickel, waste oils (observed discharging) were all detected during confirmation study. (1), (2), (3)

Rationale for attributing the contaminants to the facility:

Interviews of past employees and observations of past practices document the use and discharge of the contaminants at the facility. (1), (2), (4)

Assigned value of 45. Scoring proceeds to #4 waste characteristics.

• • •

2 ROUTE CHARACTERISTICS

Depth to Aquifer of Concern

Name/description of aquifer(s) of concern:

Artificial fill material consisting of excavated serpentinite bedrock and/or sandblast waste generated from shipyard activities (5)

Depth(s) from the ground surface to the highest seasonal level of the saturated zone [water table(s)] of the aquifer of concern:

0-5 feet

Depth from the ground surface to the lowest point of waste disposal/storage:

35 feet; assuming fill material contains same waste material

Net Precipitation

Mean annual or seasonal precipitation (list months for seasonal):

16 inches (9)

Mean annual lake or seasonal evaporation (list months for seasonal):

40 inches (9)

Net precipitation (subtract the above figures):

-24 inches

Permeability of Unsaturated Zone

Soil type in unsaturated zone:

Sandy silty sandblast waste fill

Permeability associated with soil type:

N/K

Physical State

Physical state of substances at time of disposal (or at present time for generated gases):

Liquids and solids were observed and/or reported. (1), (2), (4), (5)

* * *

3 CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

Landfill with no containment system and failed slurry wall. (5)
Other waste piles have polyethylene covers to prevent infiltration during precipitation events (4)

Method with highest score:

Unlined landfill with moderately permeable cover and no run-on or run-off control.

4 WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated:

PCBs: Toxicity rating of 3 (6); Persistence rating of 3. Thus, the matrix result of 18 was chosen

Compound with highest score:

PCBs

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (Give a reasonable estimate even if quantity is above maximum):

Estimate quantities of hazardous substances disposed of at site:
Liquid waste = 1.88×10^8 gal = 3.6×10^6 drums
Solid waste = 5.2×10^8 lbs = 2.6×10^5 yds^3 = 1.04×10^6 drums
Unknown solids = 5.2×10^6 yds^3 = 6×10^6 drums (5)

Basis of estimating and/or computing waste quantity:

Estimated from Initial Assessment Study (5)

Assigned value of 8 was given according to number of tons/cubic yards and drums.

* * *

5 TARGETS

Ground Water Use

Use(s) of aquifer(s) of concern within a 3-mile radius of the facility:

None known at this time that are operating.

Not used, but usable - assigned value of 1.

Distance to Nearest Well

Location of nearest well drawing from aquifer of concern or occupied building not served by a public water supply:

None known to be operable. Mountain Spring Water Company was not considered a well, nor is it drawing from the aquifer of concern. (13)

Distance to aquifer of concern well >3 miles-value of 0. Value of population served 0; thus the matrix value of 0 was used.

Distance to above well or building:

N/A

Population Served by Ground Water Wells Within a 3-Mile Radius

Identified water-supply well(s) drawing from aquifer(s) of concern within a 3-mile radius and populations served by each:

None known at this time, all public water wells identified in IAS report were reported to not be operational. (7)

Assigned value of 0.

Computation of land area irrigated by supply wells) drawing from aquifer(s) of concern within a 3-mile radius, and conversion to population (1.5 people per acre):

N/A

Total population served by ground water within a 3-mile radius:

None known at this time

SURFACE WATER ROUTE

1 OBSERVED RELEASE

Contaminants detected in surface water at the facility or downhill from it (5 maximum):

N/K no analysis to date - pending results from upcoming sampling January 1988.

Value of 0 used. Proceed to line 2.

Rationale for attributing the contaminants to the facility:

N/A

• • •

2 ROUTE CHARACTERISTICS

Facility Slope and Intervening Terrain

Average slope of facility in percent:

3-5% (8), (4) and average slope of intervening terrain 3-5%; thus matrix value of 1 was assigned.

Name/description of nearest downslope surface water:

San Francisco Bay - South Basin and India Basin

Average slope of terrain between facility and above cited surface water body in percent:

3-5% along shorelines at low tides (4), (8)

Is the facility located either totally or partially in surface water?

Yes, during high tide events areas of ponded surface water exist across the southern end of the site. Also, the Industrial Landfill has an area of ponded water that fluctuates according to the tides and precipitation events. (4)

Is the facility completely surrounded by areas of higher elevation?

No - the shorelines and Bay are of lower elevation

1-Year 24-Hour Rainfall in Inches

2.1 - 3.0 inches (9) thus an assigned value of 2.

Distance to Nearest Downslope Surface Water

<100 feet (5), (4) thus an assigned value of 3.

Physical State of Waste

Liquid and solid (as in Section 2); the worst case scenario was used to assign a value of 3.

• • •

3 CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

No adequate system - cover not complete, drainage improvement needed, no diversion system or leachate collection system in place. (4), (5)

Assigned value of 3.

Method of highest score:

All of above, value of 3 chosen.

4 WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated

As in Section 4 of ground-water analysis, value of 18 chosen.

Compound with highest score:

PCBs

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (Give a reasonable estimate even if quantity is above maximum):

As in Section 4 of ground-water analysis
>10,000 drums (see Section 4 of ground water)

Value of 8 chosen.

Basis of estimating and/or computing waste quantity:

As in Section 4 of ground-water analysis

5 TARGETS

Surface Water Use

Use(s) of surface water within 3 miles downstream of the hazardous substance:

Commercial fishing, recreation, recreational fishing and boating (5), (4)
value of 2

Is there tidal influence?

Not known at this time - information to be collected during RI/FS

Distance of a Sensitive Environment

Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:

N/A. No wetlands within 2 miles
Assigned value of 0

Distance to 5-acre (minimum) fresh-water wetland, if 1 mile or less:

N/A
Assigned value of 0

Distance to critical habitat of an endangered species or national wildlife refuge, if 1 mile or less:

Land along shoreline may be used by endangered species at times during migration
<1/4 mile = value of 3 assigned; however, this assessment does not indicate that a Critical Habitat, as defined by the Fish and Wildlife Service, exists within 1 mile of the site

Population Served by Surface Water

Location(s) of water-supply intake(s) within 3 miles (free-flowing bodies) or 1 mile (static water bodies) downstream of the hazardous substance and population served by each intake:

No intakes within 3 miles - Distance greater than 20 miles (10)

Computation of land area irrigated by above-cited intake(s) and conversion to population (1.5 people per acre):

N/A (9)

Total population served:

N/A

Name/description of nearest above water bodies:

N/A

Distance to above-cited intakes, measured in stream miles:

N/A. Greater than 20 miles (10)

AIR ROUTE

1 OBSERVED RELEASE

Contaminants detected:

None. N/K. Air monitoring to be conducted during ongoing RI/FS. Assigned value of 0. Proceed to line 5 enter 0.

Date and location of detection of contaminants:

N/A

Methods used to detect the contaminants:

N/A

Rationale for attributing the contaminants to the site:

N/A

• • •

2 WASTE CHARACTERISTICS

Reactivity and Incompatibility

Most reactive compound:

Sulfuric Acid and/or xylene compounds and halogenated hydrocarbons

Most incompatible pair of compounds:

Sulfuric Acid - spent caustics/battery fluids
(Group 1-B) (Group 1-A)

or

Sulfuric Acid and Caustics - solvents (organic)
(Group 4-B) (Group 4-A) (11)

Toxicity

Most toxic compound:

PCBs

Hazardous Waste Quantity

Total quantity of hazardous waste:

>10,000 drums

Basis of estimating and/or computing waste quantity:

As in Section 4 Ground-Water Analysis

• • •

3 TARGETS

Population Within 4-Mile Radius

Circle radius used, give population, and indicate how determined:

0 to 4 mi (0 to 1 mi) 0 to 1/2 mi 0 to 1/4 mi

>10,000 (7) under normal conditions. When Naval vessels are in port, 0 to 1/2 mile and >10,000 should be used.

Distance to a Sensitive Environment

Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:

N/K

Distance to 5-acre (minimum) fresh-water wetland, if 1 mile or less:

N/K

Distance to critical habitat of an endangered species, if 1 mile or less:

<100 feet assuming shoreline areas may be visited by migrating water fowl. (4) This assessment does not indicate a Critical Habitat as defined by the Fish and Wildlife Service exists within 1 mile of the site.

Land Use

Distance to commercial industrial area, if 1 mile or less:

<1/2 mile (4), (8)

Distance to national or state park, forest, or wildlife reserve, if 2 miles or less:

N/K

Distance to residential area, if 2 miles or less:

<1/2 mile (4), (8)

Distance to agricultural land in production within past 5 years, if 1 mile or less:

N/K

Distance to prime agricultural land in production within past 5 years, if 2 miles or less:

None within 2 miles

Is a historic or landmark site (National Register or Historic Places and National Natural Landmarks) within the view of the site?

N/K

FIRE AND EXPLOSION

1 CONTAINMENT

Hazardous substances present:

Oils/Spent solvents and fuels (1), (2), (4), (5) that are ignitable or flammable are present. Assigned value of 3.

Type of containment, if applicable:

In covered storage tanks and in soil/ground water (1), (3)

• • •

2 WASTE CHARACTERISTICS

Direct Evidence

Type of instrument and measurements:

N/K. Direct reading instruments will be used during RI/FS process but at this time no measurements have been taken, assigned value of 0.

Ignitability

Compound used:

Waste oils and benzene compounds, toluene, xylene (1), (3), (4) all are NFPA level 3 or 4; thus assigned value of 3.

Reactivity

Most reactive compound:

Sulfuric acid (1), (3), (4) value of 2 assigned.

Incompatibility

Most incompatible pair of compounds:

Determination made from Incompatibility Table in HRS scoring document.

Sulfuric acid/battery fluids (caustics) (1), (3), (4)
Group 1-B Group 1-A
or
Sulfuric Acid and Caustics/Solvents (organic)
Group 4-B Group 4A
Assigned value of 3

• • •

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility:

>10,000 drums

Assigned value of 8

Basis of estimating and/or computing waste quantity:

As in Section 4 Ground-Water Analyses

• • •

3 TARGETS

Distance to Nearest Population

<50' - employees, tenants, and naval personnel on-site (4). Assigned value of 5.

Distance to Nearest Building

<50' at PCB spill area and Pickling Plate Yard (4), (5). Assigned value of 3.

Distance to Sensitive Environment

Distance to wetlands:

N/K >100 feet - assigned value of 0.

Distance to critical habitat:

The site which borders the San Francisco Bay (4) may be used by endangered species at times, however no Critical Habitat exist within 1/2 mile of the site. Assigned value of 0.

Land Use

Distance to commercial/industrial area, if 1 mile or less:

<1/4 mile (5). Assigned value of 3.

Distance to national or state park, forest, or wildlife reserve, if 2 miles or less:

N/K

Distance to residential area, if 2 miles or less:

<1/4 mile to on-base housing and Hunters Point District (4), (5)

Distance to agricultural land in production within past 5 years, if 1 mile or less:

N/K

Distance to prime agricultural land in production within past 5 years, if 2 miles or less:

N/K

Is a historic or landmark site (National Register or Historic Places and National Natural Landmarks) within the view of the site?

N/K

Population Within 2-Mile Radius

>10,000 (7). Assigned value of 5.

Buildings Within 2-Mile Radius

>2,600 (7). Assigned value of 5.

DIRECT CONTACT

1 OBSERVED INCIDENT

Date, location, and pertinent details of incidents:

August 6, 1986 Lt. Leroy states that he "experienced a skin rash and other negative reactions" after sampling materials from Triple A Site 17. (2) Assigned value of 45, proceed to line 4.

• • •

2 ACCESSIBILITY

Describe type of barrier(s):

Fences surround the site with a guard on duty at the main gate. Individual sites are not permanently secured except for the Industrial Landfill. Most of the sites that border the Bay are freely accessible from the water and streets within the facility. (4)

• • •

3 CONTAINMENT

Type of containment, if applicable:

None - cover assumed to be less than 2 feet at Industrial Landfill and Bay Fill areas and asbestos piles with no cover. (3), (4), (5)

• • •

4 WASTE CHARACTERISTICS

Toxicity

Compounds evaluated:

PCB, xylene, organic solvents, halogenated hydrocarbons, copper, lead, chromium, nickel (5), (1), (3) and (2)

Compound with highest score:

PCB. Assigned value of 3.

5 TARGETS

Population within 1-mile radius

>10,000 (7). Assigned value of 5.

Distance to critical habitat (of endangered species)

<1/4 mile since surrounding Bay area may be used by the California Brown Pelican. Assigned value of 3.

5.0 REFERENCES

1. EMCON Associates, 1987. Verification of Hazardous Waste Contamination at Specified Sites at Hunters Point Naval Shipyard, San Francisco, California, Final Report.

2. Superior Court of California in and for the City of San Francisco, 1987 Hearing Proceedings of: People of California, Plaintiff, vs. Triple A Machine Shop, Inc., Defendants, Civil No. C 86 4344.

3. ERM West, 1987. Investigation of PCB's In Soil and Ground Water at the Hunters Point Site. Report to WESTDIV.

4. Harding Lawson Associates, 1987. Professional judgment based on existing literature and site reconnaissance.

5. Naval Energy and Environmental Support Activity (NEESA), (1984). Initial Assessment Study, Hunters Point Naval Shipyard (Disestablished), San Francisco, California, VIC: N62798.

6. Sax, N.I., 1975. Dangerous Properties of Industrial Materials, Van Nostrand Rheinhold Co., New York, 4th ed.

7. U.S. Department of Commerce, 1980. Bureau of Census - Population Housing Census, 1980.

8. U.S. Navy, 1987. Maps and Photographs supplied by WESTDIV, San Bruno, California.

9. U.S. Department of Commerce, 1963. Rainfall Frequency Atlas of the United States, Technical Paper No. 40, U.S. Government Printing Office, Washington D.C.

10. Public Utilities Commission, San Francisco, California, 1986. San Francisco Water and Power: A History of Municipal Water Systems, San Francisco, California.

11. California Department of Health, 1975. Hazardous Waste Management Law Regulations and Guidelines for the Handling of Hazardous Waste. Sacramento, California.

12. Harding Lawson Associates, Scoping Document 1987. Remedial Investigations/Feasibility Studies. Naval Station, Treasure Island, Hunters Point Annex, San Francisco, California. November, 1987.

13. Mee, J, 1988. Mountain Spring Water Company site inspection and information tour, February 1988.

DISTRIBUTION

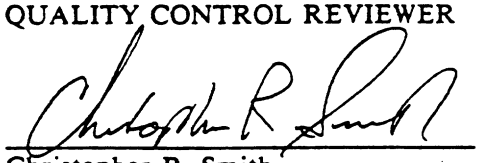
HAZARD RANKING SYSTEM PACKAGE
NAVAL STATION, TREASURE ISLAND
HUNTERS POINT ANNEX
SAN FRANCISCO, CALIFORNIA
March 31, 1988

COPY NO. ___

		Copy No.
16 copies:	Western Division Naval Facilities Engineering Command	1 - 16
1 copy:	Master File	17
1 copy:	Job File	18
1 copy:	QC/Bound Report File	19
1 copy:	Reading File	20

GSG/LST/lan/F3676-R

QUALITY CONTROL REVIEWER



Christopher R. Smith
Associate Hydrogeologist